

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

I. STATUS OF THE CLAIMS

Claims 1, 6, 8 and 9 are amended herein.

In view of the above, it is respectfully submitted that claims 1-9 are currently pending and under consideration in the present application.

II. REJECTION OF CLAIMS 1-9 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MESAKI ET AL (USP 6,217,231) IN VIEW OF ENOCHS ET AL (USP 4,818,056)

The present invention as recited, for example, in claim 1 as amended herein, relates to an optical module comprising "a photodetector mounted to the slope end surface and optically coupled directly with the optical fiber" and "said photodetector having electrodes on a rear surface thereof opposite to a front surface thereof attached to said slope end surface."

On page 2 of the Office Action, the Examiner asserts that Mesaki teaches the mounting of a photodetector on a ferrule surface. Further, on page 4 of the Office Action, the Examiner asserts that Mesaki discloses an optical device with all the limitations set forth in the claims, except it does not teach the optical device directly mounted on the surface flush with the optical fiber.

It is respectfully submitted that the Examiner's assertions as indicated above are contradictory. Nonetheless, as mentioned in the previous response filed on October 27, 2003, Mesaki discloses a ferrule having a slope end surface, which is used to minimize the reflection of light reflected back at the photodiode 46 and injected again into the optical fiber in the reverse direction (see FIGS. 23C and 23D, and column 14, lines 35-46). The end surface of the photodiode 46 is set perpendicular to the optical axis in the ferrule 40A, and an optical signal reflected back by the photodiode 46 is again reflected at the sloped end surface of the ferrule 40A in a stray direction.

Thus, as the Examiner indicated on page 4 of the Office Action, Mesaki does not teach or suggest a photodetector mounted on a slope end surface of a ferrule, and optically coupled directly with an optical fiber.

Further, the claimed optical module of the present invention includes a photodetector

having electrodes on a rear surface thereof opposite to a front surface thereof mounted on the sloped end surface of the ferrule (see claim 1 as amended herein, and page 9, lines 10-12 of the Applicant's specification). Therefore, for example, the optical module of the present invention is configured such that the photodetector is mounted directly on the sloped end surface of the ferrule and excellent optical coupling is achieved between the optical fiber in the ferrule and the photodetector.

The Examiner asserts that the Enochs reference explicitly shows an optical device directly coupled with the end ferrule surface, which is flush with the optical fiber.

However, the photodiode 30 of Enochs has a front surface terminal (i.e., the annular electrically conductive metalized layer 48 in column 4, lines 9-10 and FIG. 5) and an other terminal (i.e., "the other terminal of the diode at the back thereof" in column 4, lines 18-19), and thus, uses a substrate 40 in which the photodiode 30 is mounted (see FIG. 5), so as to enable an electrical connection of the back side terminal to the lead 38 at the same side of the substrate 40 in which the front surface terminal is connected to the lead 37.

In light of the above-described configuration of Enochs, a space is provided between the end surface of the ferrule 18 and the photodiode 30. Thus, Enochs does not teach that the photodiode 30 is coupled "directly" with an optical fiber, and has electrodes on a rear surface thereof opposite to a front surface thereof attached to a slope end surface of the ferrule 18, like the claimed photodetector as recited in claim 1 of the present invention. Due to the existing space between the end surface of the ferrule 18 and the optical fiber and the photodiode 30, Enochs suffers from the problem of reduced efficiency with regard to optical coupling. Further, the use of the substrate in Enochs complicates the construction of the optical module and thus, increases the cost thereof.

It is respectfully submitted that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. MPEP § 2143.01. Specifically, there must be a suggestion or motivation in the references to make the combination or modification.

Therefore, it would not have been obvious to one of ordinary skill in the art to combine the teachings of Mesaki and Enochs to disclose the features recited in claim 1 of the present invention.

Similar to claim 1, independent claims 6, 8 and 9 recite "a photodetector mounted to the

slope end surface and optically coupled directly with the optical fiber" and having "electrodes on a rear surface thereof opposite to a front surface thereof attached to said slope end surface," which distinguishes over the cited prior art.

Claims 2-5 and claim 7 depend from independent claims 1 and 6. Therefore, for at least the reasons that claims 1 and 6 distinguish over the cited prior art, it is respectfully submitted that claims 2-5 and 7 also distinguish over the cited prior art.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that each of the claims patentably distinguishes over the prior art, and therefore defines allowable subject matter. A prompt and favorable reconsideration of the rejection along with an indication of allowability of all pending claims are therefore respectfully requested.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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